CF-80

Continuous Flow

Seed Treater

Installation and Operation Manual

Gustafson

Advanced Seed Treatment Technology

Bayer CropScience

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The following **CF-80** manual contains installation, operation, parts list and technical drawing information.

Please read and understand these instructions completely before proceeding to install and operate the equipment.

Bayer CropScience reserves the right to change specifications, models, components, or materials at any time without notice.

For further detailed information, contact the Bayer CropScience technical representative for your area.

Please have this operation manual available when contacting Bayer CropScience.

USE CAUTION!

Always use caution and common sense when working with any chemical. Read the product label and MSDS carefully and follow their instructions exactly as described.

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Introduction

The CF-80 treater is lightweight, which makes it easy to transport. It can be installed in any convenient location on a temporary or permanent basis.

Steps for installation:

1. Choose a level location with access to a 110-volt power source. Allow enough room for feeding the seed hopper, calibrating the machine, bagging the seed and treater maintenance.
2. The treater is self-contained and includes a two-way bagger and one tank for liquid chemical application.
3. **Liquid Application** - The treater is delivered from the factory with the liquid tank installed. This system is capable of applying liquids, flowables or pour-on chemicals.

General Calibration

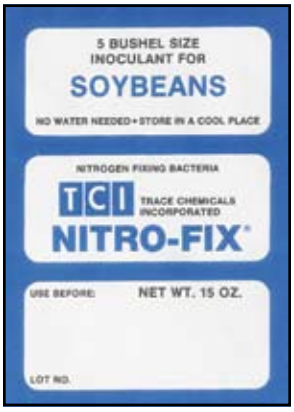
The CF-80 seed treater can be easily calibrated. Determine the type of seed to be treated. Although the CF-80 can treat up to 80 bushels per hour of soybean seed, other types of seed may not flow through the treater as freely; therefore capacity may vary. The seed gate opening can be adjusted to regulate seed flow from the hopper. An adjustment clamp can be found on the right front side of the treater, just above the power switches. To increase or decrease the seed gate opening, loosen the nut, move the adjustment clamp up or down, and retighten the nut. A good starting point is set to the seed gate approximately 3/4 open.

Seed Calibration

Before beginning chemical calibration, it is best to calibrate the seed flow. **1.** Close the seed gate. **2.** Place a known quantity of seed in the hopper. **3.** Make sure a collection bag is placed below the CF-80's two-way bagger to catch the discharged seed. **4.** Set the seed gate adjustment clamp to 3/4 open (or locked at the desired opening). **5.** Open the seed gate completely until it stops at the seed gate adjustment clamp and keep track of the time it took this known quantity of seed to empty out of the hopper.

Example: 1 bushel of soybean seed was placed in the hopper. It took 1 minute for the seed to flow out of the hopper. You know your treating rate is 60 bushels an hour. (1 bushel per minute x 60 minutes per hour = 60 bushels per hour).

Calibration & Pump Priming

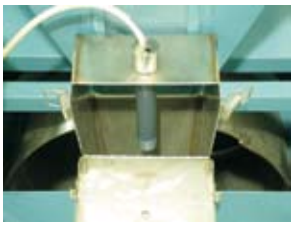


1. Read the entire chemical label and MSDS to make sure you under stand the usage and rates to be applied. Take special note whether the recommended application rate of the chemical is given in fluid ounces per bushel or in fluid ounces per cwt. of seed. If the application rate is given in ounces, you will have to convert cc's. To do so, multiply ounces by 29.6 cc's = cc's of product to be applied. The rate must be known prior to treater calibration.

Example: You have decided that the use rate of your chemical is 5 fluid oz. per cwt. of seed and you will be mixing it with 5 ounces of water. Your application rate is now 10 ounces of product.
10 ounces x 29.6 cc's = 296 cc's

2. Mix chemical for a short period of time. To do this, you must first shut **OFF** the ball valve. This will allow chemical agitation without pumping to your drum. Turn remote switch to **ON** position for mixing. **Note:** It is especially important to resuspend the chemical prior to the start of each treating day or before each treating period.

3. You are now ready to prime the pump. Open the ball valve on the premix tank. Disconnect the discharge hose from the fitting in the inlet transition and place it into the chemical tank.



Run the pump manually for 2-3 minutes set at.

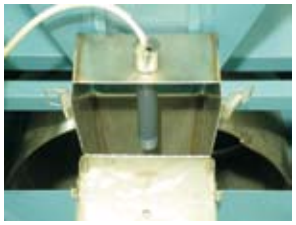
Once you have primed the pump and warmed up the hose, you are ready to calibrate. Remove the hose from the tank and place the discharge hose in a measuring cup or calibrated beaker.

Example: It has already been determined that your chemical application rate is 10 ounces (296 cc's) fluid oz. per cwt., and you ran 60 pounds of seed in one minute. Therefore it is necessary to catch 177.6 cc's of chemical in your measuring cup in one minute (296cc's ¸ 100 = 2.96cc's x 60 pounds = 177.6).

Calibration & Pump Priming

If more than the required volume of chemical is obtained, adjust the speed control knob to a lower setting and rerun the calibration check. Continue this operation until the proper rates are being measured.

Operation



When you've obtained the proper chemical-to-seed ratio, reconnect the discharge line to the fitting on the application tube. You are ready to treat seed when the proper chemical-to-seed rates are obtained. The chemical will be applied to the seed in the transition. The seed and chemical will be mixed in the blending chamber. Treated seed will then be discharged through the two-way bagger. Be sure a bag or seed bin is below the bagger to catch the treated seed when your treating operation begins.

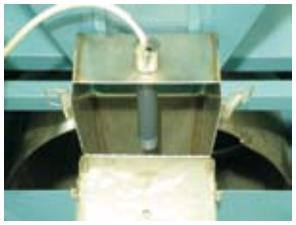
1. Turn on the power switch for the blending chamber drum.
2. Turn on the chemical applicator power switch.
3. When chemical begins flowing, immediately open the seed gate. Treating will begin.
4. As soon as seed flow stops, turn off the chemical aplicator switch. The chemical **"does not"** stop automatically. You must turn off the pump switch yo stop the chemical flow.

Routine calibration should be monitored to ensure the integrity of chemical application rates. Compare the number of seed units treated with the total amount of chemical used to determine if correct rates are obtained. Readjust chemical flow accordingly.

Since your seed may be slightly moist after treating, it will probably be necessary to open your drill more than usual to ensure proper seeding rates (usually at least 10% over untreated seed). Treated seed generally does not flow as freely as untreated seed.

Check your calibration. If extremely high or low temperatures exist, the viscosity and flowability of certain treatment chemicals will change. A typical example - treating early in the morning at cooler temperatures and then in the afternoon with warmer temps.

Maintenance



When you are finished treating seed, disconnect the discharge tubing from the elbow fitting and place it into your original chemical container. Turn your pump ON and empty the 5-gallon premix tank.

After the premix tank is empty, place the end of the discharge tubing in an empty container (example: a 5-gallon bucket). Add a small amount of clean water to the empty premix tank. Open the pump all the way and empty the premix tank. Repeat procedure until tank and pump are clean. Save the rinse water to use in the preparation of your next slurry batch.

If the applicator is going to be stored in subfreezing temperatures, flush with alcohol or antifreeze to prevent freezing which will cause pump damage. As an additional safeguard, disassemble and clean the entire pump assembly, making sure all parts are dry before you assemble and store for the next season's use.

Note: Failure to clean your treater properly or failure to completely drain all liquid from the pump and lines after use may damage the equipment and will void any warranties expressed or implied.

Check the gear reducer monthly for adequate oil level by removing the oil level indicator plug on the side of the reducer. If oil does not run out, fill until it does. Use 60W oil or equivalent.

Clean the coating chamber(s) at the end of each treating period. Failure to do so will cause chemical buildup.

Service Tips

Visual Checklist:

1. Make sure the ball valve is in ON position

2. Be sure all filters are clean.

3. Check tightness of intake line fitting - use pliers if necessary.

5. Check discharge hose for any chemical buildup.

6. ALWAYS flush pump after use with the following guidelines:

   A. When using flowable type of chemical, flush with soap and water.
   B. When using emulsifying type chemicals, flush with water containing ammonia or detergent.

Pump Checklist

Refer to factory recommendations per the pump manufacturer.

Troubleshooting

1. Make sure ball valve is in ON position.

2. Check tightness of intake line fitting - use pliers if necessary. Make sure there are no air bubbles in the line.

3. Check discharge hose for any chemical buildup.

4. Make sure the pump hose is in the correct position.

5. Make sure all bolts are tight.

Appendix

GUIDELINES FOR HANDLING SEED-APPLIED PRODUCTS AND RECOMMENDED EQUIPMENT INSPECTION AND MAINTENANCE PROCEDURES

The following are general recommendations for handling seed-applied products, equipment inspection and maintenance on most Gustafson application equipment used in commercial treating facilities. There may be situations that occur outside the scope of this document that can be addressed on a case-by-case basis by contacting the appropriate Bayer CropScience personnel.

Products: Flowables and Custom Blends with Flowables
In many cases, custom bulk blends of some products are provided to our customers. The following are general recommendations for handling the liquid (flowables) products and the blends made from them:

- Products and blends are best utilized when stored between 40-90 degrees Fahrenheit. Exposure to temperatures above and below this range for prolonged periods of time may cause the products and or blends to stratify in their containers.

- Thoroughly mix all liquid products prior to use and prior to transferring into work tanks. Bulk shuttles are equipped with top and bottom ports to allow for recirculation agitation, and returnable kegs and drums have manual stirring devices inserted. 15-20 minutes of recirculation is recommended for 200 and 400 gallon bulk shuttles. If the system is not set up for recirculation agitation then a mechanical agitation system will need to be installed. On returnable containers, manually rotate a minimum of 25-30 times clockwise and then a minimum of 25-30 times counterclockwise.

- Where products and or blends are transferred to work tanks, any mechanical agitation devices in those tanks should be shut off to reduce the amount of product that can splash up on the sidewalls and tops of those tanks. If compressed air is used to purge lines after product transfer, use the minimum amount of air pressure necessary and make sure the work tank is vented to reduce product splashing.

- After products have been transferred to their respective work tanks, resume mechanical agitation.

- Do not allow the liquid level in work tanks to be pulled below two-thirds capacity so that the products and or blends have minimal exposure to air and do not dry and or cake prematurely.

General Equipment

- Check filters daily at least once. Clean rinse off as necessary. The filter assemblies are intended to keep agglomerates, plant debris and other foreign substances from going through the system and plugging lines. If an accumulation of material is found, the filter basket should be removed and rinsed free of the debris.

- Clean pump and product lines frequently to avoid an accumulation of product buildup over time.

- Avoid low spots or bows on hoses and supply lines where products may have a tendency to accumulate and or settle.

- If the treating system is being shut down for a weekend or more, fill the work tanks to their maximum level and flush any product from the lines to avoid any potential product settling.

- Product supply lines running from a pump to the application equipment should be installed so they run laterally and up to the treater to ensure constant flow and complete product removal when the lines are drained.

Electronic and CBT Treating Systems

- Conduct 'on-the-go' calibration checks frequently by checking the amount of product being pumped from the closed calibration cylinder versus the product delivery rates that the computer is indicating. GLCPS systems rely on peristaltic pump hose integrity; wear and tear on it will affect the calibration. Periodic inspection and recalibration should help improve calibration accuracy.

- Make routine 'loss-in-weight' calibration inspections when product supply tanks are mounted on weighing scales. While the machine is running, a loss in weight should be observed. The elapsed time for this weight loss can be used to cross check accuracy against the rate per minute displayed on the computer screen.

- On the CBT-200 batch treaters, inspect the 20-l batch weighing tank used to receive and dispense any products. If an accumulation of product is visible it should be removed and cleaned.

12.0 Warranty

LIMITED WARRANTY, LIMITATION OF LIABILITY & CLAIMS

Bayer CropScience warrants that the Gustafson application equipment shipped hereunder shall be free of defects in materials or workmanship for a period of one (1) year from the date of delivery. BAYER CROPSCIENCE MAKES NO OTHER WARRANTY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESSED OR IMPLIED. IN NO EVENT SHALL BAYER CROPSCIENCE BE LIABLE TO CUSTOMER FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES REGARDLESS OF WHETHER ARISING IN CONTRACT, STRICT LIABILITY, OTHER TORT OR OTHERWISE. THE EXCLUSIVE REMEDY OF CUSTOMER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE SALE, USE OR HANDLING OF THE GUSTAFSON APPLICATION EQUIPMENT WHETHER IN CONTRACT, WARRANTY TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE PAID, OR AT BAYER CROPSCIENCE'S SOLE ELECTION, THE REPAIR OR REPLACEMENT OF APPLICATION EQUIPMENT.

No shipment of Gustafson application equipment, or any portion thereof, is returnable by customer, unless such shipment or portion thereof is defective in one or more of its components. In the event that customer believes that the Gustafson application equipment is defective, written notice must be provided to Bayer CropScience by customer within one (1) year after the date of delivery of the equipment. Failure to provide such notice shall constitute customer's irrevocable acceptance of the Gustafson application equipment and waiver of any claims for errors, deficiencies, or imperfections therein. Any attempt to return a shipment of Gustafson application equipment, or portion thereof, for any other reason after the expiration of the time period set forth herein shall be an ineffective rejection of such Gustafson application equipment, and customer shall be invoiced by Bayer CropScience and shall pay the invoice in full, including any storage, freight, or other costs for returned Gustafson application equipment or any portion thereof.

Upon notice to Bayer CropScience that the application equipment is defective, Bayer CropScience shall have the right to send a representative to customer's facility, or inspect the equipment after having received it from customer. If Bayer CropScience determines that any Gustafson application equipment is defective, Bayer CropScience shall replace such application equipment at its expense.

If Bayer CropScience disagrees with customer's conclusion that the Gustafson application equipment is in any way defective, or if the defect or damage was caused, directly or indirectly, by customer's action or inaction, customer shall be charged for all costs associated with sending the equipment or replacement parts to customer.

Notwithstanding the foregoing, the limited warranty contained herein does not apply to the following:

Maintenance - This includes, but is not limited to, such things as cleaning, flushing systems, corrosion prevention, mechanical or electrical adjustments, or repairs which become necessary through normal wear and tear; or periodic maintenance such as lubrication and gear or variable speed oil changes.

Service and wear items - This includes, but is not limited to, the replacement of belts, drive chains, sprockets, fasteners, bulbs, fuses, ball bearings, bushings and other electrical or mechanical components that have a useful life based on how much these components are used.

Lack of service - This includes, but is not limited to, damage attributable to failure to perform maintenance in services in accordance with the manufacturer of the component.

Damage - This includes, but is not limited to, damage resulting from negligence, improper installation, the installation process, improper or incorrect wiring, corrosion, construction welding, or freight damage.

Controls - Systems without Bayer CropScience supplied control packages or systems using other controls are not covered under the terms of this warranty.

TRAINING, CALIBRATION ASSISTANCE AND SERVICE CALLS

Bayer CropScience trained employees may assist in the training and calibration of equipment - Due to factors such as temperature variations, seed flow changes, improper mixing procedures and other factors that are out of Bayer CropScience's control, Bayer CropScience does not accept responsibility for the calibration of the system. Electronic controlled seed and chemical proportioning systems - Infield training and calibration assistance of up to 15 hours or 1 trip to the purchaser's location is included in the price of qualified electronic controlled seed and chemical proportioning system. Additional hours will be billed to the purchaser at $60 per hour plus travel expenses for units in the continental United States. Electronic controlled seed and chemical proportioning systems purchased outside of the continental United States $60.00 per hour portal to portal will be billed to the purchaser. Service calls for non-warranty items will be charged at $60.00 per hour portal to portal plus expenses. All other standard application equipment - Service calls for non-warranty items will be charged at $60.00 per hour port to port.

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